Opener Question

i) $(+3)+(-6)=$ ii) $(-6)-(-3)=$

iii) $(+6)\times(-2)$ iv) $\frac{-8}{-2}$

v) $(+3)\times(-2)\times(+4)\div(-3)=$

Feb 4-7:03 AM

Opener Question

i) $(+3)+(-6)=$ -3 ii) $(-6)-(-3)=$ -3

iii) $(+6)\times(-2)$ -12 iv) $\frac{-8}{-2}+4$

v) $(+3)\times(-2)\times(+4)\div(-3)=$

$-6\times+4$

$-24\div-3$

$+9$

Feb 4-7:03 AM

#7 a)

$-3(-2)+(-4)(-3)^2$

$-[(-2+3)+(-4-3^2)]$

$=+6+(-4)(+9)-[+1+(-4-9]$

$=+6+(-36)-[+1+-13]$

$=-30-(-12)$

$=-18$

Feb 2-11:56 AM

Operations with Fractions

Mixed Number $3\frac{1}{2}$

Improper Fraction

numerator is larger than the denominator $\Rightarrow \frac{3}{2}$

- *convert to an improper fraction before completing operation*

Sep 8-8:03 PM

Operations with Fractions

Mixed Number $3\frac{1}{2}+\Rightarrow\frac{7}{2}$

Improper Fraction

numerator is larger than the denominator ⇒ 3/2

- *convert to an improper fraction before completing operation*

Sep 8-8:03 PM

Addition and Subtraction (common denominator)

$\frac{4}{5}-\frac{1}{10}$ $-\frac{1}{3}+\frac{1}{4}$

Sep 8-7:59 PM

Addition and Subtraction (common denominator)

$\frac{4}{5} - \frac{1}{10}$ $\quad \frac{-1}{3} + \frac{1}{4}$

Sep 8-7:59 PM

$\frac{5}{7} + \frac{1}{3}$ $\quad -6\frac{1}{4} + \left(\frac{-3}{4}\right)$

Feb 9-8:42 PM

$\frac{5}{7} + \frac{1}{3}$ $\quad -6\frac{1}{4} + \left(\frac{-3}{4}\right)$

Feb 9-8:42 PM

Multiplication and Division

i) $\frac{1}{3} \times \frac{2}{7}$ $\quad$ ii) $\frac{3}{4} \times \frac{3}{5}$

Rules

Feb 4-7:10 AM

Multiplication and Division

i) $\frac{1}{3} \times \frac{2}{7}$ $\quad$ ii) $\frac{3}{4} \times \frac{3}{5}$

Rules multiply numerators, multiply denominator; lowest terms

Feb 4-7:10 AM

Reciprocal (second term)

i) $\frac{2}{3} \div \frac{1}{8} =$ $\quad$ ii) $\frac{3}{4} \div \frac{1}{2} =$

iii) $6\frac{1}{2} \div \frac{3}{5} =$

Feb 4-7:12 AM

Reciprocal (second term)

i) $\frac{2}{3} \div \frac{1}{8} =$ $\frac{2}{3} \times \frac{8}{1} = \frac{16}{3}$

ii) $\frac{3}{4} \div \frac{1}{2} =$ $\frac{3}{4} \times \frac{2}{1} = \frac{6}{4}$

iii) $6\frac{1}{2} \div \frac{3}{5} =$ $\Rightarrow \frac{3}{2}$

$\frac{13}{2} \times \frac{5}{3} = \frac{65}{6}$

Feb 4-7:12 AM

Operations with Rational Numbers (Fractions)

Rational numbers are numbers that can be expressed as the quotient of two integers, where the divisor is not zero.

Set of rational numbers: $\mathbf{Q} = \left\{ \frac{a}{b} \mid a, b \in \mathbf{I}, b \neq 0 \right\}$

Addition and Subtraction
To add or subtract rational numbers, determine a common denominator.

Division
To divide by a rational number, multiply by the reciprocal.

$\frac{a}{b} \div \frac{c}{d} = \frac{a}{b} \times \frac{d}{c} = \frac{ad}{bc}$

Multiplication
To multiply rational numbers, first reduce to lowest terms (if possible).

$\frac{a}{b} \times \frac{c}{d} = \frac{ac}{bd}$

More Than One Operation
Follow the order of operations.

Feb 9-8:45 PM

Exponent Laws

3^4 and a^n are called powers.

3^4 and a^n (exponent, base)

4 factors of 3: $3^4 = (3)(3)(3)(3)$

n factors of a: $a^n = (a)(a)(a)\ldots(a)$

Operations with powers follow a set of rules.

Rule	Description	Algebraic Expression	Example
Multiplication	When the bases are the same, keep the base the same and add exponents.	$(a^m)(a^n) = a^{m+n}$	$(5^4)(5^{-3}) = 5^{4+(-3)} = 5^{4-3} = 5^1 = 5$
Division	When the bases are the same, keep the base the same and subtract exponents.	$\frac{a^m}{a^n} = a^{m-n}$	$\frac{4^6}{4^{-2}} = 4^{6-(-2)} = 4^{6+2} = 4^8$
Power of a Power	Keep the base, and multiply the exponents.	$(a^m)^n = a^{mn}$	$(3^2)^4 = 3^{(2)(4)} = 3^8$

Sep 8-8:04 PM

Operations with Exponents

i) $3^2 \cdot 3^3$ 3^{2+3} 3^5

ii) $\frac{2^8}{2^6}$ 2^{8-6} $\Rightarrow 2^2$

iii) $\frac{3^3 \cdot 3^2}{3^4}$ $\frac{3^{3+2}}{3^4}$ $\frac{3^5}{3^4}$ 3^{5-4} 3^1

iv) $(5^2)^3$ $5^{2\times 3}$ 5^6

Jan 31-8:31 AM

Evaluate $(-3)^{-4}$.

Evaluate $\left(\frac{5}{6}\right)^{-2}$.

Evaluate $\frac{5^{-4}(5^8)}{(5^{-3})^2}$.

Sep 8-8:05 PM

Evaluate $(-3)^{-4}$. $\left(\frac{1}{-3}\right)^4$ $= \frac{1}{81}$

Evaluate $\left(\frac{5}{6}\right)^{-2}$. $\left(\frac{6}{5}\right)^2$ $\frac{36}{25}$

Evaluate $\frac{5^{-4}(5^8)}{(5^{-3})^2}$. $\frac{5^{-4+8}}{5^{-3\times 2}}$ $\Rightarrow \frac{5^4}{5^{-6}}$ $5^{4-(-6)}$ 5^{10}

Sep 8-8:05 PM

Evaluate $(-3)^{-4}$.

$\left(\frac{1}{-3}\right)^4$

$\frac{1^4}{-3^4} = \frac{1}{+81}$

Evaluate $\left(\frac{5}{6}\right)^{-2}$.

$\left(\frac{6}{5}\right)^2$

$\frac{6^2}{5^2}$

$= \frac{36}{25}$

Evaluate $\frac{5^{-4}(5^8)}{(5^{-3})^2}$.

$\frac{5^{-4+8}}{5^{-3\times 2}}$

$\frac{5^4}{5^{-6}}$

$5^{4-(-6)}$

5^{10}

$5^{\square}$ 10

Sep 8-8:05 PM

Additional Exponent Laws

4) Power of 0

5) Negative Power

6) Multiple Bases to a Power

Feb 4-7:17 AM

Additional Exponent Laws

4) Power of 0

$= 1$

5) Negative Power

reciprocal — +ve power

6) Multiple Bases to a Power

add the powers

Feb 4-7:17 AM

This section is designed to give you practice using the exponent rules and not being able to get a numerical answer via your calculator. Some questions will ask you to substitute values in for x;

You MUST simplify the expression first with the variables then it can be used for any value.

$$\frac{x^7(y^2)^3}{x^5y^4}$$

Sep 8-8:07 PM

Homework
Worksheet; *Discover the Exponent Laws*
*q. 1-8 odds , 15 a & d, 17, 19**

Operations with Rational Numbers

q. 1-4 odds

Friday Feb 9th - Grade 9 Review Test

Feb 3-11:24 AM